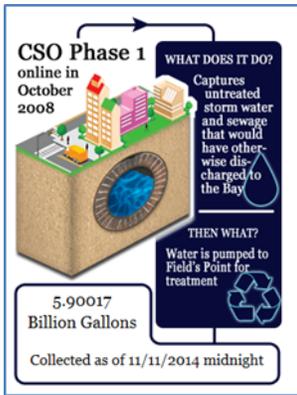


Combined Sewer Overflow (CSO) Tunnel Water Quality Improvements

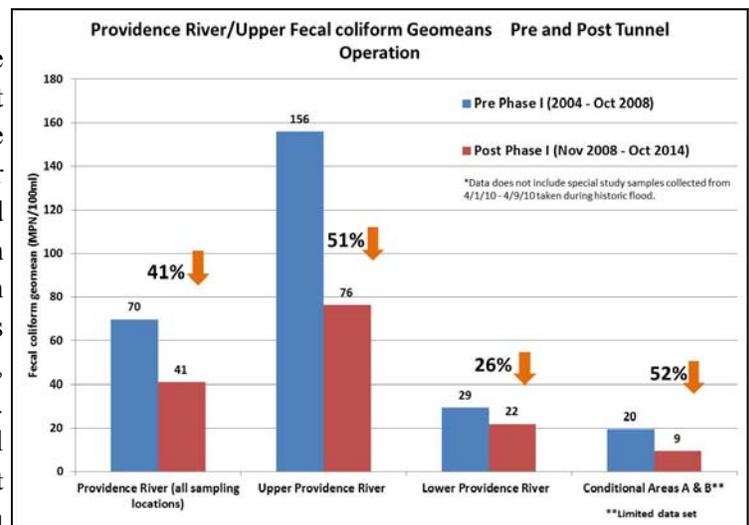


NBC CSO Abatement Project

The NBC CSO Tunnel is a 26-foot-diameter, 3-mile-long tunnel built under the city of Providence to capture untreated wastewater and stormwater flow from CSOs. During rain events, excess flow travels from sanitary sewer and stormwater pipes to an interceptor, then into the 65-million-gallon CSO tunnel. As flows decrease at Field's Point, the wastewater and stormwater in the CSO tunnel is pumped to the facility and receives full treatment. Since the tunnel was put into operation in November 2008, the CSO tunnel has captured over *5.9 billion gallons* of untreated wastewater and stormwater that would have otherwise been discharged through CSOs directly into local rivers and the Bay. By reducing CSO discharges, the NBC is improving water quality and protecting human health.

Water Quality Improvements

Since the NBC CSO Tunnel has gone into operation, the average yearly discharge from the wet weather facility has been reduced by 77%, with an impressive average decrease of 81% in wet weather discharge events per year. Since this flow now receives full secondary treatment and disinfection, the NBC CSO Tunnel has prevented 5.9 billion gallons of untreated, sewage-contaminated stormwater from entering urban rivers and the Bay. NBC estimates that millions of pounds of pollutants, including over 70,000 pounds of metals, have been prevented from entering the rivers and the upper Bay. In addition, bacteria pollution has been reduced, with an overall 41% decrease in fecal coliform bacteria in the Upper Bay (Point Street Bridge to Conimicut Point). Specifically, there has been a 51% reduction in the Upper Providence River (Point Street Bridge to Gaspee Point), 26% decrease in the Lower Providence River (Gaspee Point to Conimicut Point), and 52% in the Conditional Shellfishing Areas A and B.



Shellfishing Improvements

Clean water is essential to the multi-million-dollar shellfishing industry in Rhode Island. Historically, the two most northern shellfishing areas in the Bay, Areas A and B, were closed after rainfall totals of 0.5 inches and 1.0 inch within 24 hours, respectively. After construction of the CSO Tunnel, the closure regulations have been increased to higher rainfall amounts, with Area A now closing with ≥ 0.8 inches of rain and Area B with ≥ 1.5 inches of rain. The CSO tunnel was highlighted as the reason for the historic changes: *"the changes are a result of water quality improvements associated with the completion of Phase I of the three-phase Narragansett Bay Commission combined sewer overflow program in 2008"* (DEM Press Release, May 26th, 2011). On average, Area A is expected to be open 65 more days/year and Area B to be open 45 more days/year to shellfishing.

Beach Closure Improvements

At beaches considered to be impacted by the NBC CSOs, Bristol Town Beach, Barrington Town Beach, and Conimicut Beach, there was a 44% decrease in closure events and an 82% decrease in closure days in 2010 compared to 2006 (years of similar rain). In addition, beaches sampled as part of the "Urban Beach Initiative", Sabin's Point, Rose Larisa Park and Gaspee Point, were found to have compliance rate with pathogen standards of ~85% in 2010 and ~74% in 2011, similar to beaches in areas with fewer pollution impacts. Because of this initiative, East Providence is looking to open Sabin Point as a licensed beach!